D3

(12) UK Patent Application (19) GB (11) 2 061 576 A

(21) Application No 8037918
(22) Date of filing 19 Dec 1978
Date lodged 26 Nov 1980
(30) Priority data
(31) 5415277
(32) 29 Dec 1977
(33) United Kingdom (GB)
(43) Application published
13 May 1981
(51) INT CL³
G06F 15/20
(52) Domestic classification
G4A 17B 5A 5X 9F 9X U
(56) Documents cited
None
(58) Field of search
G4A
(60) Derived from Application
No. 49055/78 under
Section 15(4) of the
Patents Act 1977
(71) Applicants
Cannon Industries
Limited, Gough Road,
Bilston, West Midlands
WV14 8XR
(72) Inventors
John William Warren,
Reginald Williams,
Nigel Graham Moore
(74) Agent
H. V. A. Kirby, Central
Patent Department, The
General Electric Co. Ltd.,
Hirst Research Centre,
Wembley, Middlesex
HA9 7PP

(54) Cooking aid

(57) A cooker incorporates a solid state logic circuit and means providing variable inputs thereto representative of the material to be cooked in the oven of the cooker, the weight of the material, and the degree of cooking required, the logic circuit being arranged to generate, in response to said variable inputs, output signals indicative of the appropriate cooking time and temperature, and the cooker incorporating control means responsive to the output signals for controlling the temperature and time of the cooking operation.

GB 2 061 576 A

2061576

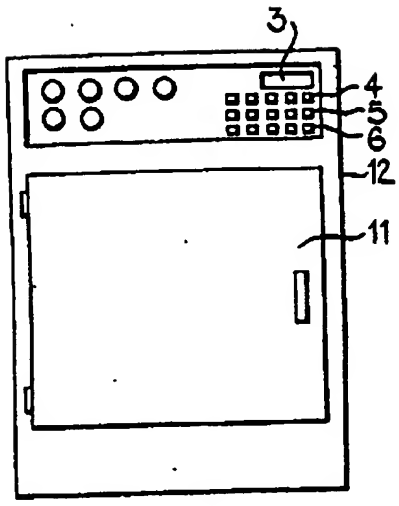

Fig.1

2061576

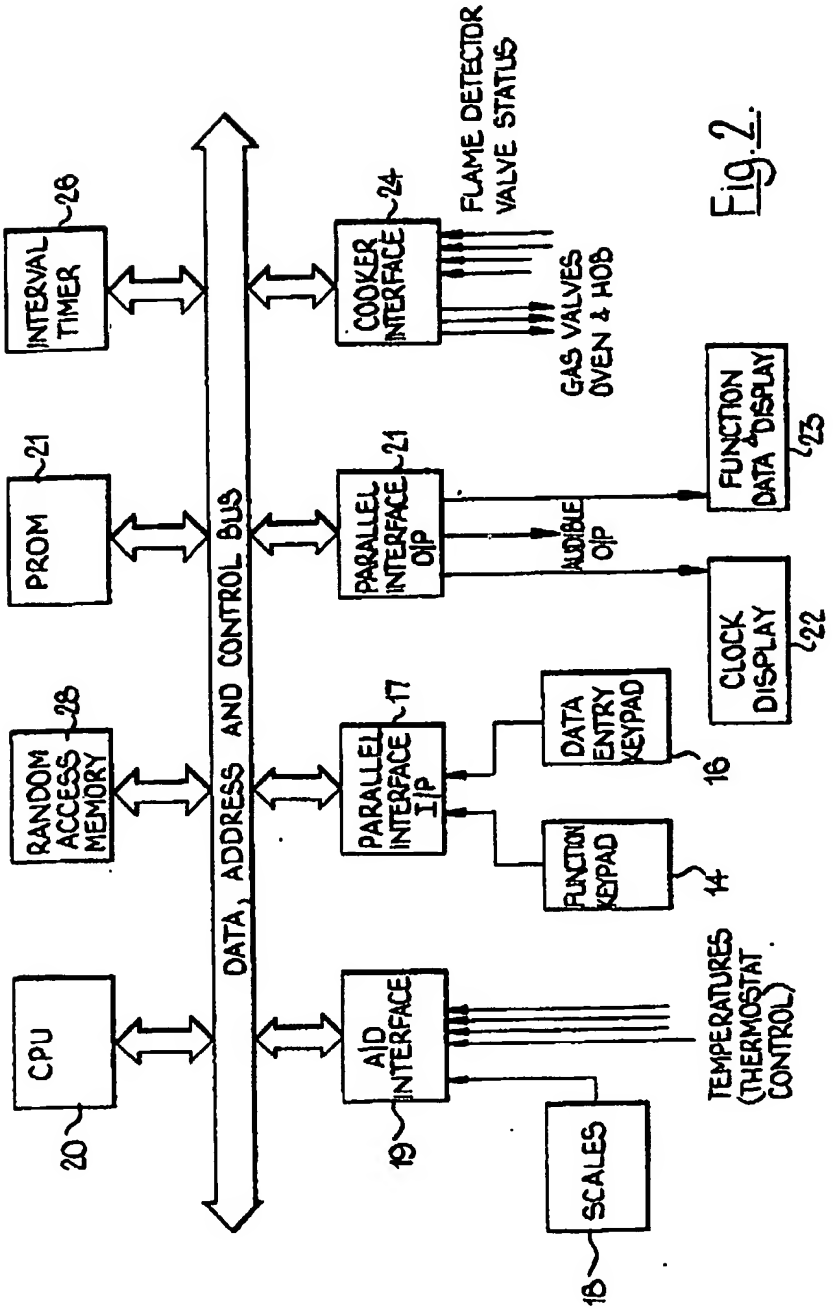

Fig. 2.

SPECIFICATION

Improvements in or relating to cooking aids

This invention relates to aids to cooking.

It is known that, when roasting meat, for example, the time for which the meat needs to be cooked in an oven depends upon both weight of the meat and the desired degree to which the meat is required to be cooked to suit the taste of the individual, for example from rare to well done. The temperature and/or time also depend upon the type of meat being cooked. Other materials also require to be cooked at different temperatures and for different times depending on the nature of the material and the weight thereof.

According therefore, to the invention, a cooker incorporates a solid state logic circuit, means providing variable inputs thereto representative of the material to be cooked in the oven of the cooker, the weight of the material, and the degree of cooking required, and the logic circuit being arranged to generate, in response to said variable inputs, output signals indicative of the appropriate cooking time and temperature, and the cooker incorporating control means responsive to the output signals for controlling the temperature and time of the cooking operation.

Thus in the case of a gas cooker an output from the logic circuit is arranged to control at least one gas valve controlling the supply of gas to one or more gas burners within the oven in response to temperature signals fed into the logic circuit from one or more temperature sensors.

The cooker may incorporate a plurality of temperature sensors disposed at different positions within the oven.

In some cases a plurality of gas burners may be disposed at different positions in the oven, with the gas supply to individual burners controlled by separate gas valves, the valves being arranged to be controlled in response to temperature signals fed into the logic circuit from an associated temperature sensor.

In the case of an electric cooker a plurality of electric heating elements may be disposed in different positions within the oven, with the electric current to the different elements controlled by separate switching devices, each of which is similarly arranged to be controlled in response to temperature signals fed into the logic circuit from an appropriately positioned temperature sensor.

In some cases a cooker might incorporate an automatic timer having means for delaying the start of a cooking operation until an instant such that the calculated period terminates at a pre-set time.

The cooker may also incorporate a weighing device whose output is fed directly to the logic circuit to provide one of the inputs thereto.

The cooker preferably incorporates a display means for providing a visual indication of the cooking time and temperature, or other information for example the time when a cooking operation is set to finish. Moreover the logic circuit may be programmed to vary the cooking temperature for certain materials being cooked over the cooking period, in order to follow a desired cooking profile.

Whilst the invention is particularly suitable for use as an aid to cooking meat, the logic circuit may in some cases be programmed to display or control the times and temperatures for cooking other items.

The logic circuit may also be arranged to control the operation of hob units which may be mounted on or separate from the oven. Thus the logic circuit may be fed with information to indicate food to be cooked, an empty vessel being placed on the weighing device, and the food placed into it, together with water or other liquid if required, so that the weight of the food and the amount of water or other liquid added can be calculated, the logic circuit then controlling the operation of the appropriate hob unit to bring the contents of the vessel to the boil and simmer for an appropriate length of time. The start of the cooking operation, e.g. the ignition of a gas burner or the switching on of an electric heater, can be arranged to take place automatically at a time calculated by the logic circuit, in order to complete the cooking operation at a selected time. The time selected must of course, be such that an adequate length of time is allowed for the cooking operation.

Two embodiments of the invention will now be described by way of example with reference to Figures 1 and 2 of the accompanying schematic drawings.

Figure 1 represents a device in accordance with the invention as applied to a gas cooker.

Figure 2 represents a more sophisticated arrangement in accordance with the invention for controlling the operation of a gas cooker.

Figure 1 shows an embodiment in which a logic circuit 1 is incorporated into the control system of the oven 11 of a gas cooker represented diagrammatically at 12.

The cooker carries on its control panel keys 4, 6, which can be depressed to correspond to the type of meat and the degree of cooking required. There is provided a further set of keys 5 which can be selectively depressed to correspond to the weight of the meat, and to provide appropriate input signals to the logic circuit.

The output of the logic circuit is arranged to control a thermostat control and a timer so as to provide the appropriate temperature and cooking time in dependance upon the setting of the keys 4, 5, and 6, as well as indicating these values on a display panel 3.

However the cooker may incorporate a weighing device for the meat to be cooked whose output is arranged to be fed directly into the logic circuit and the "weight" keys 5 in such a case may be dispensed with.

Further refinements may readily be provided, and Figure 2 illustrates a further form of control arrangement for a gas cooker in the form of a microcomputer.

This incorporates keypads 14, and 16 for feeding into the control computer via a parallel input interface 17, data representing the material to be cooked and the degree of cooking required, and a weighing device 18 the output of which is fed into the control system via an analogue to digital interface 19.

These inputs are fed into a microprocessor 20 which effectively selects a program in a programmable read only memory 27.

A number of programs are stored in the programmable read only memory (PROM) 27. The first of these controls the communications with the user and will accept commands from the function keypad 14 and the data entry keypad 16 via the parallel input interface 17. This information is stored within the microcomputer in the random access memory 28, along with the weight of the food, read from the scales 18 and transferred via the analogue to digital interface 19. Other programs in the PROM relate to the cooking of specific foods and are selected by reference to the data in the random access memory. The cooking program uses the parameters that have already been stored in the random memory to calculate the cooking time and oven temperature settings. From this calculation, together with information on the time that the food is required also fed into the system by appropriate keys on the data keypad 16, the start of the cooking time can be determined. The cooking is initiated by a signal being sent via the cooker interface 24 and suitable control elements (now shown) to open an electrically operated gas valve of any convenient kind and ignite the oven burner utilising any suitable electrical ignition system. The control of temperature may be achieved by direct control of the gas valve using temperature measurements from the oven, entered into the processor via the analogue to digital interface 19. A number of temperature sensors may be provided if desired at different parts of the oven to provide a more accurate control of the oven temperature. In some cases separate valves controlling two or more differently positioned burners may be individually controlled. The progress of cooking can be indicated by outputs from the microcomputer via the parallel output interface 21 to a clock display 22 and a function and data display 23. The interval timer 26 is a means of relating the operation to real time and is used by the microcomputer to update the system clock. In some cases a display of the time of day can be requested by the user, by means of an appropriate key.

A further output may also be arranged to energise a device giving an audible or visual signal that a cooking operation has been completed.

The selected program may also be arranged to adjust the thermostat for varying the cooking temperature at different times during a cooking operation. For example, when cooking meat it may be desirable to heat the oven to a suitably high temperature for a first part of the cooking period and then to reduce the temperature towards the end of the period. This can readily be arranged with an arrangement as above described.

In addition to controlling the oven the timer may be arranged to control the ignition of hob units at appropriate pre-set times, a further control (not shown) being provided for this purpose.

Furthermore the control arrangement may be utilised to control the hob units in dependence on the materials and the quantity being heated thereon in a similar manner to material being cooked in the oven. For example, a vessel such as a saucepan may be arranged to be placed on the scale, information on the food to be cooked being fed into the computer, the food being placed in the vessel, and an amount of water added if required, the computer being arranged to control a selected burner on which the vessel is subsequently placed, to bring the contents of the vessel to the boil and simmer for an appropriate time, the completion of the whole cycle being controlled as for the oven.

Flame detectors for the oven and the hobs may be provided for effecting through the control system a closure of a valve to a respective burner in the event that the burner flame extinguishes or fails to ignite.

It will be seen that the invention provides a versatile cooking aid, and in connection with a micro-computer controller as above described enables various cooking operations to be automatically controlled. The various elements of such a controller capable of controlling the required sequence of cooking operations are available in standard form and may readily be selected by those skilled in the art for performing the requisite control.

CLAIMS

1. A cooker incorporating a solid state logic circuit, means providing variable inputs thereto representative of the material to be cooked in the oven of the cooker, the weight of the material, and the degree of cooking required, the logic circuit being arranged to generate, in response to said variable inputs, output signals indicative of the appropriate cooking time and temperature, and the cooker incorporating control means responsive to the output signals for controlling the temperature and time of the cooking operation.

2. A cooker according to Claim 1 incorporating an automatic timer having means for delaying the start of a cooking operation until an instant such that the calculated cooking period terminates at a pre-set time.

3. A cooker according to Claim 1 or 2 incorporating a weighing device for material to be cooked, and whose output provides an input to the logic circuit.

4. A cooker according to any one of Claims 1 to 3 wherein the logic circuit is programmed to vary the cooking temperature for certain materials being cooked, over the cooking period, in order to follow a desired cooking profile.

5. A cooker according to any one of Claims 1 to 4 having a display means for providing a visual indication of the cooking time and temperature.

6. A cooker according to any one of Claims 1 to 5 wherein the oven is heatable by means of one or more gas burners.

7. A cooker according to Claim 6 wherein an output from the logic circuit is arranged to control at least one gas valve controlling the supply of gas to one or more gas burners within the oven in response to temperature signals fed into the logic circuit from one or more temperature sensors.

8. A cooker according to Claim 7 incorporating a plurality of temperature sensors disposed at different positions within the oven.

9. A cooker according to Claim 8 incorporating a plurality of gas burners disposed at different positions within the oven, and a plurality of gas valves controlling the supply of gas to respective burners, each of which valves is arranged to be controlled in response to temperature signals fed into the logic circuit from an associated temperature sensor.

10. A cooker according to any one of Claims 1 to 5 wherein the oven incorporates one or more electric heating elements for effecting the heating of the oven.

11. A cooker according to Claim 10 wherein an output from the logic circuit is arranged to control at least one switching device controlling the supply of electric current to one or more heating elements within the oven in response to temperature signals fed into the logic circuit from one or more temperature sensors.

12. A cooker according to Claim 11 incorporating a plurality of temperature sensors disposed at different positions within the oven.

13. A cooker according to Claim 12 incorporating a plurality of heating elements disposed at different positions within the oven, and a plurality of switching devices controlling the supply of electric current to respective elements, each of which switching devices is arranged to be controlled in response to temperature signals fed into the logic circuit from an associated temperature sensor.

14. A cooker incorporating or associated with a computer having keypads for feeding into the computer data representing the food to be cooked in the oven of the cooker, the degree of cooking required and the time that the food is required, and a weighing device arranged to feed into the computer data indicative of the weight of food placed on the device, the computer being arranged to calculate from said data the appropriate cooking period and oven temperature setting, to initiate the cooking operation, control the oven temperature during the cooking operation, and terminate the operation at the selected time.

15. A cooker substantially as shown in and as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1981. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.